ЕНИСЕЙСКАЯ СИБИРЬ

YENISEY SIBERIA

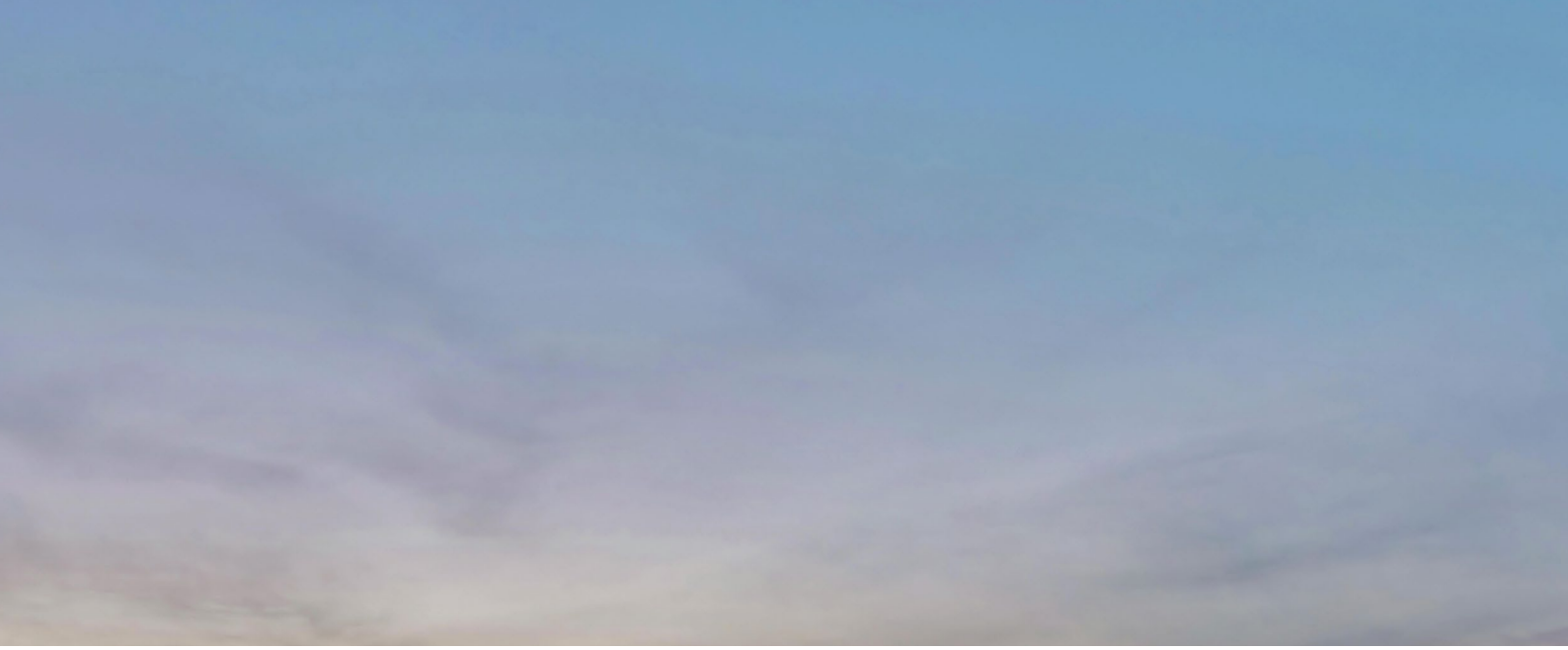
КРАСНОЯРСКИЙ КРАЙ ХАКАСИЯ ТЫВА
KRASNOYARSK REGION KHAKASSIA TYVA



Yenisey Siberia Atlas of Emerging Jobs



Atlas
in electronic
format



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Dmitry Sudakov,

Head of the project
Atlas of Emerging Jobs

Our world is becoming more and more rapid and unpredictable. Everything changes very quickly and knowledge and skills become obsolete. We can no longer afford to act by inertia, to choose the same professions in which our older relatives were successful and expect that after receiving a diploma, we will be able to work in one field for the rest of our lives without retraining. The time has come for a more strategic and proactive approach. And the Atlas of Emerging Jobs of Yenisey Siberia will help you master this approach - to understand what trends affect the labor market, what new technologies are coming, what new tasks are emerging within a particular industry and how a request for new specialists is formed. But it is important to remember that this is not a collection of ready-made recipes, but rather a tool that develops your thinking. And if you use such a tool, you will come across many useful discoveries.

Sergey Ladyzhenko,

Director General
Yenisey Siberia Development Corporation



Development of the industrial potential of the regions within the framework of the implementation of the Yenisey Siberia CIP is connected, first of all, with the creation of new jobs. It poses challenges for the personnel training system and requires its adaptation to the current and future needs of companies.
It is necessary to understand what awaits us in the future and constantly develop and acquire knowledge that will be applicable in the future. In order for a professional to realize their potential and remain in demand, it is necessary to stay ahead of the labor market, gaining relevant knowledge, mastering new practical skills, introducing new technological solutions. The Atlas of Emerging Jobs will show which industries will develop dynamically and which specialists will be in demand by employers, will help to choose the right direction in which to invest your time and effort.



Edham Akbulatov,

Rector of the Siberian State University of Science and Technology named after M.F. Reshetnev

The education system has always been a pillar, a forge of highly qualified personnel. Today, more than ever before, we face a large-scale and responsible task - to determine the vector of development and training of specialists who will form our future with their achievements SibSAU named after M.F. Reshetnev, being a flagship university, should meet the high demands for professionals in industry, mechanical engineering, woodworking and chemical industries.So only timely, joint work of universities and employers will allow us to keep up with the ongoing changes. The Atlas of Jobs helps educational organizations to see the need for new format specialists and provide them with appropriate training.

Maxim Rumyantsev,

Rector of Siberian Federal University

The implementation of Russia's key strategic objectives and the modern development of industries, business, technology and innovation requires the education system to respond promptly to market demands. The Atlas of Emerging Jobs of Yenisey Siberia is a list of promising professions, the fundamental knowledge of which can be obtained at the universities of the Krasnoyarsk Territory, the Tyva Republic and the Republic of Khakassia. It is very important that the prospects of certain professions are evaluated by future employers: from leaders of national industry to small innovative companies.

A successful career depends on the desire of students to master a particular profession. But it is the task of universities to offer high-quality and interesting educational programs, as well as to demonstrate their future importance for humanity.



There is a lot of talk about the need to diversify the economy and transition to an innovative development trajectory not only in Russia, but also in the whole world. The existing trends in demography, technology, geopolitics, and regional politics are forming a new economic structure.

Today, on the territory of the Krasnoyarsk Territory, the Republic of Khakassia and the Tyva Republic, a comprehensive investment project **(CIP) Yenisey Siberia** (Decree of the Government of the Russian Federation No. 571-r dated March 29, 2019) is being implemented, combining the economic and infrastructural capabilities of the three regions. The implementation of the projects included in the CIP will require the involvement of a large number of qualified personnel in various areas in competitive sectors of the economy.

In this regard, **the Atlas of Emerging Jobs of Yenisey Siberia** is extremely relevant. The Atlas contains a list of promising industries and professions for the next 15 years, helps to structure new directions in the economy and production, and also shows the need of new industries for personnel in the medium and long-term perspective.

The history of the Atlas of Emerging Jobs began in 2010 at the EduCamp educational forum. The forum participants wanted to find out the prospects for Russian education in the next 15-20 years and developed the Rapid Foresight methodology to understand the opportunities and threats of the future and agree on joint actions.

According to the results of the Foresight, a roadmap for the development of the industry is created.

The methodology turned out to be very effective, and then came the «Foresight of Competencies - 2030» - a joint project of ASI and the Moscow School of Management SKOLKOVO, the purpose of which was to identify requirements for future specialists of the new economy. Based on the results of this study, in which thousands of experts took part, an Atlas of Emerging Jobs was created. In 2016, the head of the manager Dmitry Sudakov presented plans to create regional versions of the Atlas to Russian President Vladimir Putin.

TRENDS ANALYSIS IN THE HUMAN CAPITAL DEVELOPMENT

Methodologist Peter Georgievich Shchedrovitsky notes in his works: «Naive ideas about the transition to the so-called post-industrial era, which were widespread 10 years ago, are gradually being destroyed under the influence of common sense arguments. Hopes to build an economic system in which no one will produce anything, and the entire population will be involved only in trade and services, including intellectual ones, are being adjusted under the influence of the progressive course of the new industrial revolution. The emerging industrial system will, out necessity, be industrial - it will simply produce other goods using other technologies.»

This statement indicates that it is necessary to clearly define the boundaries and opportunities that arise with current changes in a rapidly changing world that can significantly affect the implementation of projects included in the Yenisey Siberia CIP, while getting into ideas of creating silicon valleys on the banks of the Yenisey River.

Such boundaries and possibilities were well presented in the report «Russia 2025: from staff to Talents» made by The Boston ConsuLting Group, lnc. in 2017.

Let's formulate the main theses of this report. The first thesis, which deals with the difficulties of the transition Russian economy to a new way of life, is formulated as **the absence of a critical mass of demand for knowledge**. The authors of the report mentions dependence of Russian economy on the raw materials sector, which does not create sufficient demand for high technologies and is focused on the export of natural resources. This limitation is extremely important to keep in mind while considering the goals and objectives of the project implementation, since the companies participating in the Yenisey Siberia CIP are mostly raw materials oriented.

The second thesis: **the education system does not train personnel for the knowledge economy.** This thesis reveals the inertia and interrelation of all levels of education system from secondary to higher. It is necessary to create interconnections at all levels of education and actively use new forms of standarts, different from those established by the state. At the same time, the effect of the educational system on a person should not end at the age of 24. **Changing the practice of lifelong learning should become the new normal** not only for companies - investors of Yenisey Siberia CIP, but also for all market participants.

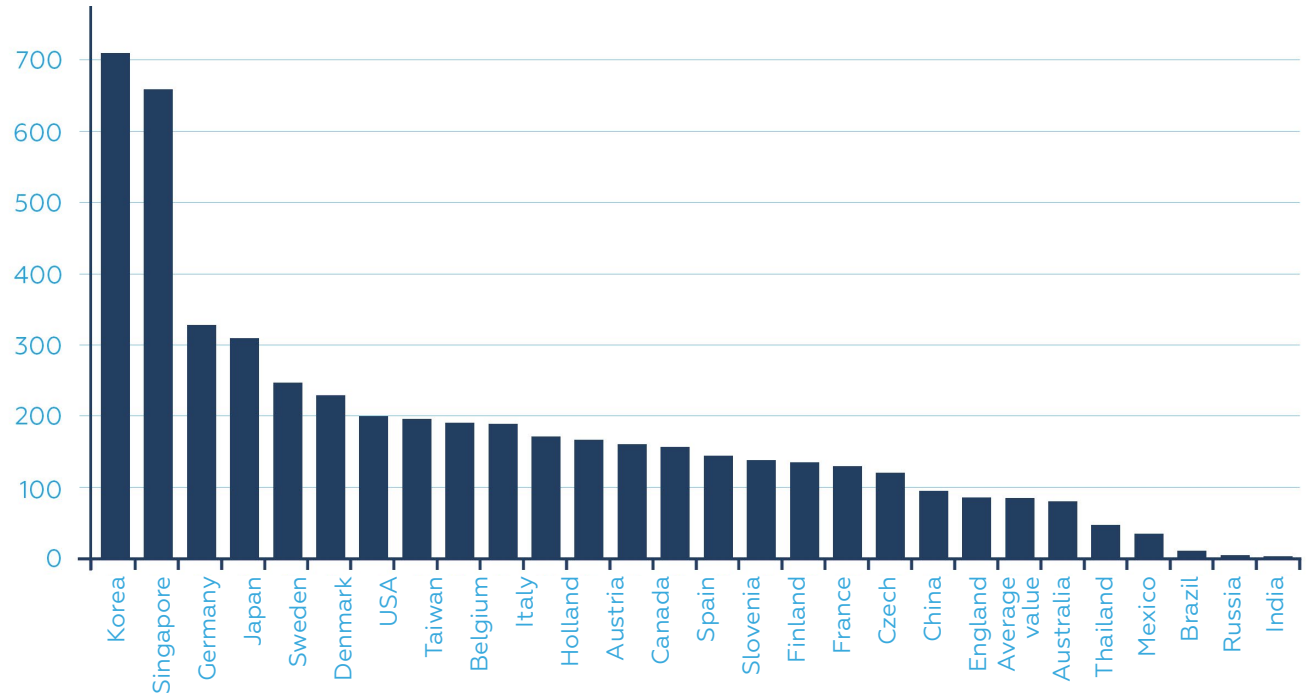
The final thesis, which we would like to take from the aforementioned report, proceeds from the fact that the barrier to the transition to a new industrial way of life is **outdated infrastructure and the lack of space for human development and self-realization**. In the Yenisey Siberia CIP there are projects which allow to create such a space and environment.

Having defined the boundaries and opportunities that affect the development of the Yenisey Siberia CIP, it is necessary to analyze existing trends, as well as provide several striking examples of new educational practices that are already being used in Russia. They have undergone some kind of adaptation as the basis for benchmarking to change the training system in the Krasnoyarsk Territory, the Republic of Khakassia and the Tyva Republic.

Nowadays the principle of globalization is changing rapidly and brings along such consequences as the termination of existing unions. It is expressed by the rupture of international agreements initiated by the US administration, and most vividly by the withdrawal of Great Britain from the European Union. his leads to the fact that **the economies of individual countries become regional.** The regionalization of the Russian economy is expressed through **import substitution and import independence programs.** At the same time, countries are beginning **to block immigration flows,** primarily illegal ones, which provide an influx of low-skilled labor. Additionally, countries are trying to introduce **restrictive trade measures,** and this is clearly seen from the example of the trade war between the United States and China. The trade war affects not only the economic condition of certain subjects of economic interaction, but in the long run it also affects development of human capital. For instance, the impact of the US administration's sanctions imposed on the Chinese company Huawei also leads to the refusal of cooperation with leading American and English universities. The resulting material damage caused to Huawei by other market participants and universities ultimately gets in the way of new technologies development, since modern high-tech companies often have more research potential than scientific organizations, especially in breakthrough digital technologies. In this case, we are talking about the key SG technology.

The world's population will be approximately 8.5 billions people by 2030, according to the UN. It is 1.2 billion people more than it was in 2015. At the same time, **the demand for average-skilled labor is decreasing** due to automatization and robotization of production. For example, Foxconn, a leading electronics manufacturer in China, cut about 60 thousand employees in 2016, replacing them with 40 thousand robots.

The total number of industrial robots in the world is steadily growing: data from the 2018 report of the Information Technology and Innovation Foundation (Information Technology & Innovation Foundation,



The number of robots per 10 thousand production workers in 2017

USA) shows that in many countries this indicator has crossed the psychological barrier: one robot per 100 workers. For example, the number of industrial robots per 10 thousand production workers in 2017 in South Korea was 710; in Singapore - 658; in Germany - 322; in Russia - 4. The global average is 85.

Highly qualified people are becoming even more in demand, but **they are also subject to increased requirements for the level of proficiency in soft skills.** This demand for unique people is expressed through the purchase and high market evaluation of high-tech startups, which often do not have even stable economic indicators that could serve as a reason for the purchase. This means that large companies are buying teams and their unique business models.

The number of unique companies with an estimated value exceeded $1bln amounted to 376 in just nine months on 2018, although in 2013 there were only 39 of them.

There is a growing gap between the real industry demand to universities and the challenges that have arisen. Accordingly, when implementing the Yenisey Siberia CIP, it is necessary to determine which projects included in it require specialists and what qualifications they should have. Companies and universities should focus on the problem of oversupply of people with medium qualifications and a shortage of low-skilled and highly skilled labor in the market.

At the same time, it should be noted that the trends affecting the change in personnel requirements are rather not geopolitical or demographic, but technological. First of all, **this is due to the high availability of the technologies.**

For example, 72,6 % of households in Russia had Internet access in 2017, and by 2024 this figure will be 97 % (Passport of the national program «Digital Economy of the Russian Federation», 2018).

The availability of digital technologies significantly **changes people's activity and opportunities for education and self-training.**

Thus, according to the monograph written by G. A. Krasnova and G. V. Mozhaeva «Electronic education in the era of digital transformation» (2018), electronic education showed the highest growth rates among educational technologies. In addition, people are moving into the service sector due to the reduction of barriers to access clients directly and the possibility of promoting goods through social networks. Digital technologies are changing the way of life not only in households, but also in at work. Most of the training programms already require either developed skills in using information and communication technologies, or programming skills. Technological platforms are changing faster in some industries than the life circle of certain means of production ends. For example, a modern 3D metal printer can replace several lathes, milling machines and machining centers.

The challenges associated with the rapid change of technologies, as well as the emergence of breakthrough technologies, will have a great impact on the development of the projects included in the Yenisey Siberia CIP.

The enterprises implementing these projects mostly belong to the extractive industry. In this regard, it makes sense to outline the main trends in the development of the industry, as well as to outline in more detail the features of **digital transformation,** that can help respond to these challenges.

The trend of urbanization in the face of the world's population growth will lead to **an increase in demand** for electricity and, accordingly, the products of the extractive industry. For example, the growth in coal consumption is increasing by 0.6% annually, and by 2040 the proportion of coal in the energy market will be at least 30%.

A similar scenario is likely with respect to the consumption of copper, cobalt, lithium and other metals.

New markets of renewable energy sources require 4-12 times more copper than traditional ones. The ammount of electric vehicles and high-power batteries produced is also growing.

The prospect of new sales markets will require the extractive industry to increase the volume of mining and, accordingly, **additional human and technological resources**.

The flip side of the extractive industry development is the constantly increasing expenditure part of the companies budget. According to the McKinsey consulting company, capital expenditures of the mining industry in increased by 35 % in 2017 compared to 2010; personnel costs increased by 41%, and total operating costs almost doubled. This trend is directly reflected in the final cost of the product, as well as its marginality.

Logic leads the management of companies to understand the need to increase production productivity and reduce its costs to ensure competitiveness.

One of the solutions may be the use of digital technologies and **the implementation of the «Factory of the Future»** model as a form of modern industry organization, involving the active use of advanced technologies during the fourth industrial revolution.

The fourth industrial revolution is primarily accounts for cyber-physical systems with the unification of the material and digital worlds. We can talk about the fundamental importance of 3D technologies, mathematical modeling technologies, and IT technologies.

Digital technologies are of particular interest to business today. An increase in labor productivity alone can bring mining enterprises more than $ 300 billion of additional revenue per year.

Digital transformation allows for maximum economic efficiency. Modern IT systems determine the causes of downtime, evaluate the quality of raw materials and final products, monitor the serviceability of equipment, the degree of congestion of logistics flows. Many companies who are already implementing advanced management systems significantly increase the productivity of equipment while reducing the resources consumed and stabilizing the.

But despite the obvious advantages, many companies, unfortunately, consider digitalization as simply as an introduction of digital technologies, not realizing that their introduction will bring a global change to business efficiency. The overall level of digitalization of the primary sector of the economy in Russia is **extremely heterogeneous.** The largest players in the global market are required to meet a high level of digitalization. Local enterprises have not yet fully embraced digital transformation, which is primarily due to the lack of digital literacy of managers.

Digital transformation of enterprises of the primary sector of the economy in the near future will also change the requirements for personnel training. On the one hand, the **demand** for the specialized IT skills and mathematical systems modeling is increasing. On the other hand, specialists are becoming more **versatile,** their skills equally in demand by companies of different industries. Thus, we see that the influence of geopolitical, demographic, and technological trends can significantly affect the development of human resources required for the implementation of projects included in the Yenisey Siberia CIP.

Therefore, it is necessary to consider the highlighted trends in more detail and assess their impact. The key questions when considering trends will be: how does the change of trends affect the Yenisei Siberia CIP projects, taking into account the Russian specifics of import substitution and import independence?

It seems necessary to form **a list of competence requirements** for personnel in each industry. These competencies will actually become the framework for the educational programs of the future.

The influence of all three groups of trends – geopolitical, demographic and technological – is clearly shown in the examples provided for benchmarking in the following sections.



JOBS IN DEMAND FOR THE YENISEY SIBERIA CIP IMPLEMENTATION

The Krasnoyarsk Territory is among the ten subjects of Russia that make the main share of Russia's GDP. It occupies the 7th place in the Russian Federation and the 2nd place in the SFD in mining, the 6th place in the Russian Federation and the 1st place in the SFD in the production and distribution of electricity and gas, etc.

	Krasnoyarsk Territory	Republic of Khakassia	Tyva Republic
Gross regional product	**1882,3** bln rubles	**207,6** bln rubles	**59,1** bln rubles
Key economic indicators, January 2020			
extractive industry	**64 598** mln rubles	**5 177** mln rubles	**1 374** mln rubles
manufacturing industry	**92 747** mln rubles	**7 808** mln rubles	**32,5** mln rubles
high-tech industry	**101,2** mln rubles	**0,3** mln rubles	

Having determined the position of the Yenisey Siberia regions in the Russian economy and the all-Russian trends in the labor market, we will consider the general directions of the jobs of the future.

Within the framework of this study the main industries are identified: agro-industrial complex, mining, processing, and high-tech industry.

Each of these areas requires its own approach to the training of personnel and the definition of future jobs. However, it should be noted that there are trends in the development of the labor market of the future.

Special requirements are imposed not only on emloyees, but also on executives.

The superprofessional skills for executives, which were identifed at advanced enterprises in Russia, are:

- problem statement skills;
- conflict resolving skills;
- the skill of uniting people to solve a common problem;
- soft interpersonal communication skills, such as:
  - critical thinking is a way of thinking in which incoming information and one's own beliefs and attitudes are analyzed;
  - ability to innovate and model, «to see» what is missing in our reality, (creativity);
  - people management skills;
  - coordination and interaction skills;
  - the ability to understand emotions, intentions and motivation, as well as the ability to manage one's own emotions and the emotions of other people (emotional intelligence).

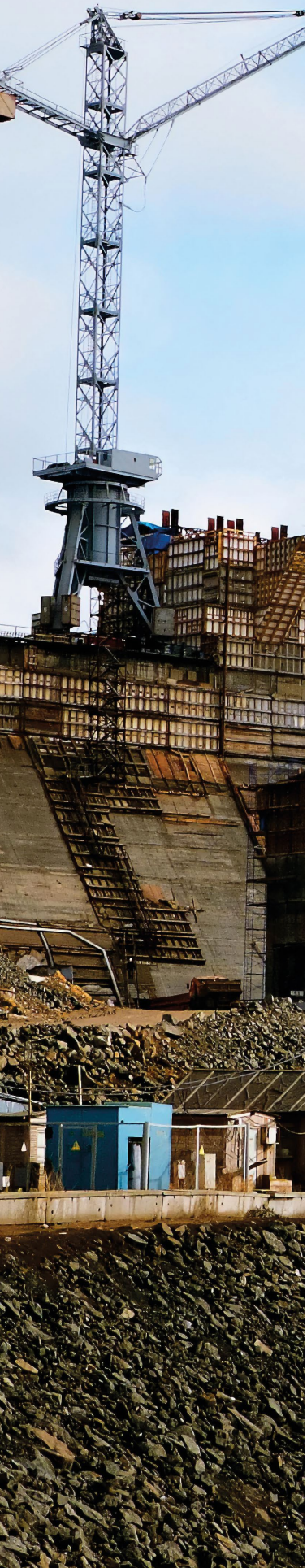
Technical competence takes only the eighth place among the many factors that affect the productivity of a manager.

Interpersonal skills were the most important:

- customer orientation;
- ability to negotiate;
- cross-industry communication skills;
- the skill of working in conditions of uncertainty and tasks;
- ability to manage projects and processes;
- ability to find information solutions;
- systems thinking;
- environmental thinking;
- stress tolerance, ability to work in a team;
- lean manufacturing;
- cognitive flexibility - the ability to quickly switch from one thought to another, think about several objects at once, keep in mind heterogeneous, contradictory ideas at the same time being able to act on them.

In the most progressive industries, knowledge ceases to give a competitive advantage in one and a half to two years. In order to create and maintain competitiveness, it is necessary to update and generate new knowledge.

INTERSECTORAL PROFESSIONS PROMISING FOR THE YENISEY SIBERIA REGIONS



Financial lawyer
Финансовый юрист с опытом трансформации финансовой функции

A specialist who optimizes, accompanies and structures transactions, also according to international law.

Head of a single service center
Руководитель единого сервисного центра

A specialist who optimizes and supports Internet of Things systems in industry.

Customer experience manager
PR-проповедник

A specialist who creates a set of impressions that a client receives when interacting with a company that provides them with a service or supplies goods.

E-commerce manager, E-commerce, KAM
Специалист по интернет-коммерции

Specialist responsible for online sales development or company's own ecommerce platform. It is the basis of hybrid organizations and a new job for most companies.

Head of digital, digital performance manager
Руководитель цифровых платформ

Professional who has experience in successfull launch of a product, online store, effective advertising campaign, or a social media community aimed at promoting a hybrid organization.

HR-generalist
Тактик и стратег в сфере работы с персоналом

Specialist who performs the full range of HR functions: from recruitment and development of individual employee motivation programs to creating corporate culture of the enterprise and its KPI system.

Manager of crowdfunding and crowdfunding platforms
Менеджер краудфандинговых и краудинвестинговых платформ

Specialist who organizes the work of crowdfunding platforms, pre-evaluates projects intended for crowdfunding , examines conflicts between contributors and authors of projects.

Intellectual property valuer
Оценщик интеллектуальной собственности

Specialist who determines the value of intangible assets: ideas, inventions, business models, etc.

Builder of smart roads
Строитель «умных» дорог

Specialist who selects and installs a «smart» road surface with sensors for monitoring the condition of the road, as well as «smart» signs, markings and video surveillance systems; designes interchanges, optimizes the movement of traffic flows.

Urban environmentalist
Урбанист-эколог

A specialist who designs new environmentally friendly cities.

Specialist in overcoming systemic environmental disasters
Специалист по преодолению системных экологических катастроф

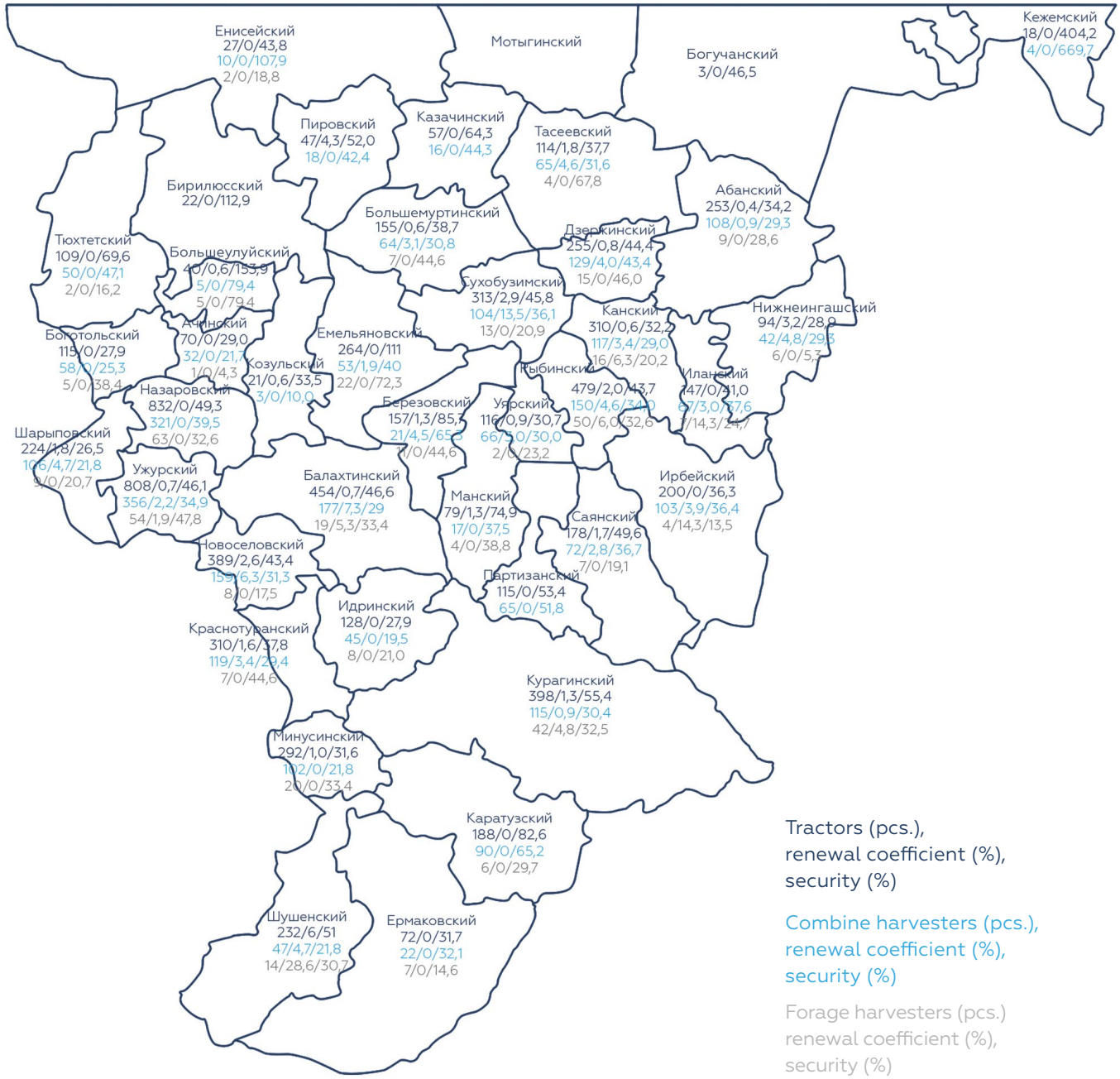
A specialist in the field of prevention the disasters that people gradually start to comprehend: pollution around industrial centers, radiation dumps, melting glaciers.

AGRO-INDUSTRIAL COMPLEX

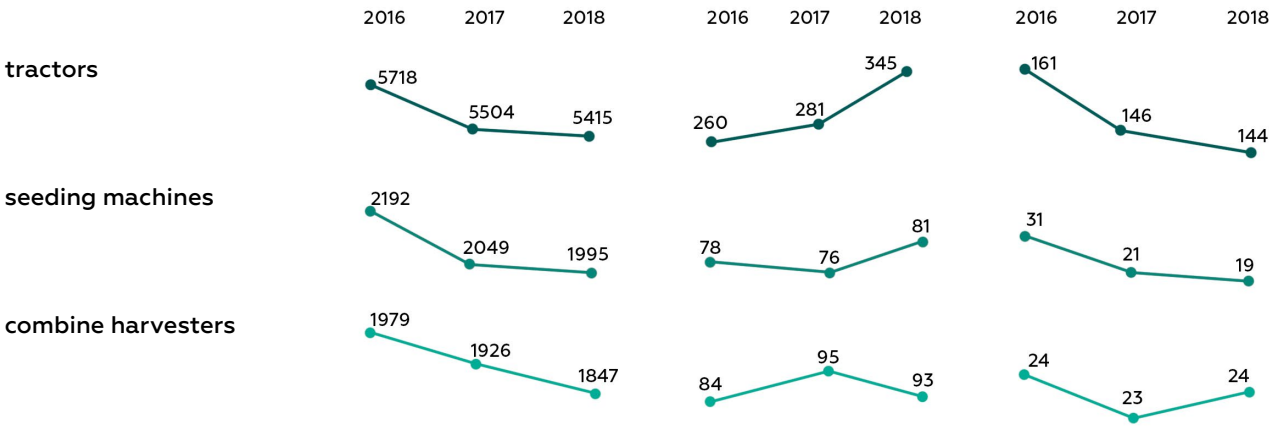
Changing the set of professional skills in the industry

Agricultural professions do not enjoy great popularity but according to experts their prestige is to grow in the future. Technological innovations will make it possible to efficiently process areas using fewer hands, and the complexity of the industry will change the requirements for the quality of human resources.

When analyzing the current state of development of the agro-industrial complex of the Krasnoyarsk Territory, the Republics of Khakassia and Tyva, it can be said that the engineering and technical support of agricultural production is declining in most areas. The coefficient of renewal of agricultural machinery is lower than in the SFO, and significantly lower than in the Russian Federation as a whole. At the same time, the energy supply of agricultural organizations is at a fairly high level. In 2017, the Krasnoyarsk Territory occupied the second place, the Republic of Khakassia – the 12th place, the Republic of Tyva - the 1st place in the rating of agricultural organizations energy supply among the subjects of the Russian Federation.



Availability of agricultural machinery in agricultural organizations on the example of the districts of the Krasnoyarsk Territory



Comparative characteristics of the number of agricultural machinery in agricultural organizations of the Krasnoyarsk Territory, the Republic of Khakassia, the Tyva Republic

In the near future, a number of new tasks will appear in the field of agriculture, respectively, a number of new jobs.

The list of new tasks in the agricultural sector includes:

- automation and informatization of agricultural enterprises, farms;
- designing and managing complex automated processes of the agro-complex;
- development of competitive seed production and breeding work;
- use of alternative energy sources in agricultural production processes;
- ensuring a system of relations between personnel, business and government in agriculture;
- conducting interdisciplinary research and development in the fields of biotechnology, computer science and robotics;
- environmental monitoring.

Agro-specialists of the future will need systematic thinking, developed organizational skills and knowledge in the field of IT and biotechnology. Farmers need to learn to think like innovative entrepreneurs - to apply new technological solutions that increase the efficiency of their farms.

Along with the development of the industry, much attention is paid to environmental issues - harmful fertilizers and production technologies will gradually be replaced with

environmentally friendly ones. Agricultural robots and «smart» systems will gradually switch to solar and wind energy. In the USA, alternative energy has already equaled the cost of traditional energy.

As a result of the foresight session held at SibGU named after M.F. Reshetnev on 01.11.2019, the following trends of the agroindustrial complex were identified:

- the period of import substitution growth is one of the most short-lived, it should end by 2024-2025;
- тcultivation of new non-traditional agricultural crops on the territory of the Krasnoyarsk Territory is a trend to appear by 2027 . This trend can continue indefinitely until there is a need for specialization of agriculture in the regions;

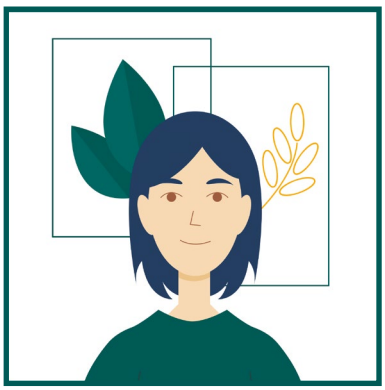
the trend of 2032-2035 is the growth of non-resource exports in the agro-industrial complex (exports of finished products).

Other trends are long-term - they go beyond 2037.

They include:

- ecologization of agricultural production;
- waste-free production;
- increasing the requirements of consumers and the population to the quality of food, the quality of products, and their useful properties.





PERMACULTURE AGRICULTURAL MANAGER

A specialist engaged in the design of agriculture based on the interaction of natural ecosystems. Allows to produce environmentally friendly products at the lowest cost. It is especially important for the regions of the Far North and areas with unfavorable farming conditions.

Professional skills and abilities

- systems thinking
- project management skill
- environmental conscious thinking
- ability to work with big data and digital doubles

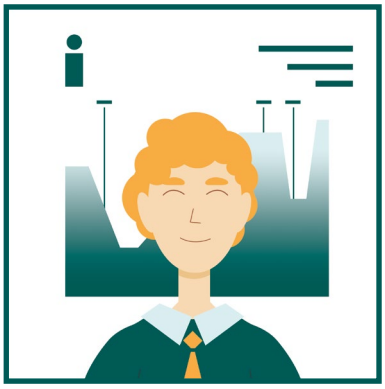


AGRICULTURAL ECONOMIST

Highly qualified specialist ensuring the competitive performance of products and cost-efficient operation of agricultural companies; adjusting operations of an enterprise to suit the needs and requirements of the market. Responsible for managing a firm's economic risks. While a few schools do provide training in the specialty, demand for it still exceeds supply on the job market.

Professional skills and abilities:

- systems thinking
- robotization
- environmental conscious thinking
- customer orientation
- ability to negotiate



GASTRONOMIC BRANDS DESIGNER

A specialist who performs complex work on studying the specifics of local bioresources, seasonal changes in food products at the regional level, historical forms of gastronomic practices of the region, opportunities to reveal the cultural traditions of the region through authentic food products. Based on this criteria creates a modern designer «packaging» for the original cuisine based on the principles of rational nutrition.

Professional skills and abilities:

- systems thinking
- project management
- environmental conscious thinking
- customer orientation
- artistic skills

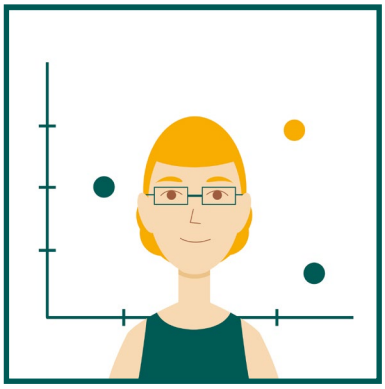


CLIMATE MANAGER

Specialist in climate management. Creates special conditions to minimize the influence of climate change, selects crops and agricultural technologies for maximum effect. Engaged in the optimization of air flows and the creation of ecosystems.

Professional skills and abilities:

- systems thinking
- environmental consious thinking
- ability to work with big data and digital doubles
- ability to work under uncertainty and rapid change of task
- projects and processes management
- ability to find information solutions



NATURAL DECENTRALIZED EXCHANGE LOGISTICS MANAGER

A specialist who builds optimal logistics routes taking according to seasonal needs and changes. Re-distributes the manufactured products taking into account the year's yield. Determines the methods and places of storage of manufactured products. This area of activity is associated with the introduction of a digital system of natural exchange, work with big data, digital doubles.

Professional skills and abilities:

- systems thinking
- cross-industry communication skills
- programming, robotics, artificial intelligence
- ability to work under uncertainty and rapid change of task



BREEDER OF ENDANGERED ANIMAL SPECIES

A specialist engaged in improving existing and breeding new species of animals, plants and other living organisms that have their own characteristics that are useful to humans or help them adapt more effectively to environmental conditions. This area of activity includes selectionism, embriology, restoration of the number of cattle in the circumpolar territories of the Krasnoyarsk Territory (musk ox, snow sheep, elk, deer, etc.).

Professional skills and abilities:

- project management
- environmental conscious thinking
- cross-industry communication skills
- ability to find information solutions



UNMANNED VEHICLE CONTROL MANAGER

A specialist who controls the course of technological processes in agriculture with the help of unmanned vehicles. Unmanned vehicles include ground harvesters and other vehicles, as well as unmanned aerial vehicles used in crop production, animal husbandry, etc.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- programming, robotics, artificial intelligence
- ability to work under uncertainty and rapid change of task



TERRAFORMER

Specialist in the design of territories and land. Their activity includes cultivation of the land after fires and other disasters, identification of the necessary actions and calculation of the efficiency of the use of the site for different cultures. Determines the life cycle of the product and production; areas optimization (for forestry, livestock, crops, etc.). Trends: effective use of space.

Professional skills and abilities

- systems thinking
- project management
- robotics
- environmental conscious thinking
- ability to work with big data and digital doubles

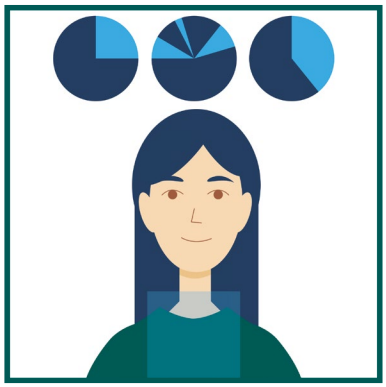


BIOPRODUCTION TECHNICIAN

Specialist in product lifecycle management. Develops technologies for manufacturing new products, defines a new product range and their shelf life. Uses digital doubles and models of agricultural products. Optimizes technological processes, excluding chemistry and genetic engineering.

Professional skills and abilities

- systems thinking
- environmental conscious thinking
- ability to work with big data and digital doubles
- lean manufacturing skills



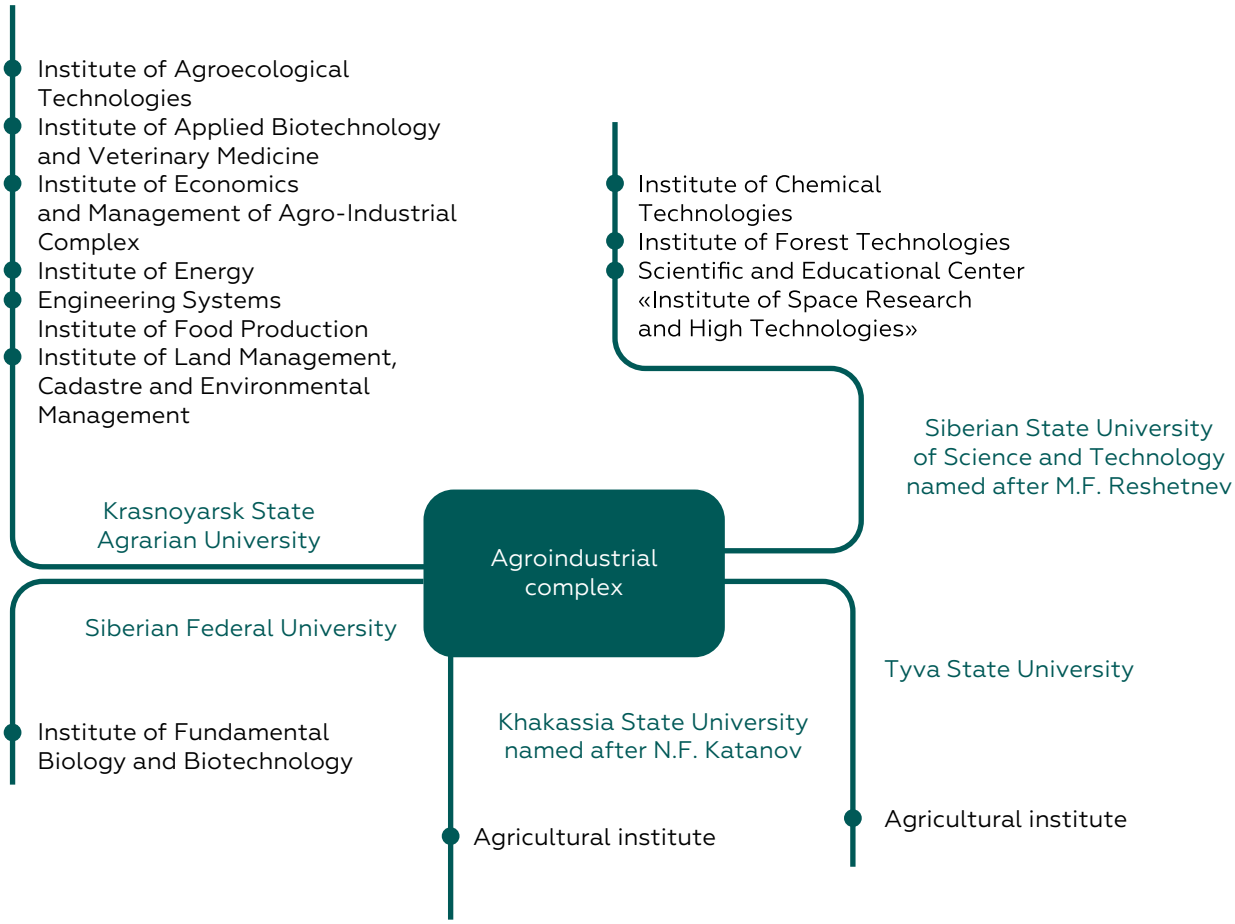
ECOVILLAGE MANAGER

A specialist who competently plans, calculates and supports the environmental friendliness and efficiency of both the settlement and adjacent territories, as well as production of eco-products. Recently, eco-settlements have been actively developing, based both on independent ecological production of products and on the creation of an ecological infrastructure for living and life support.

Professional skills and abilities

- systems thinking
- project management
- environmental conscious thinking
- cross-industry communication skills

Where can i receive basic training in the specialty in the Yenisey Siberia regions?

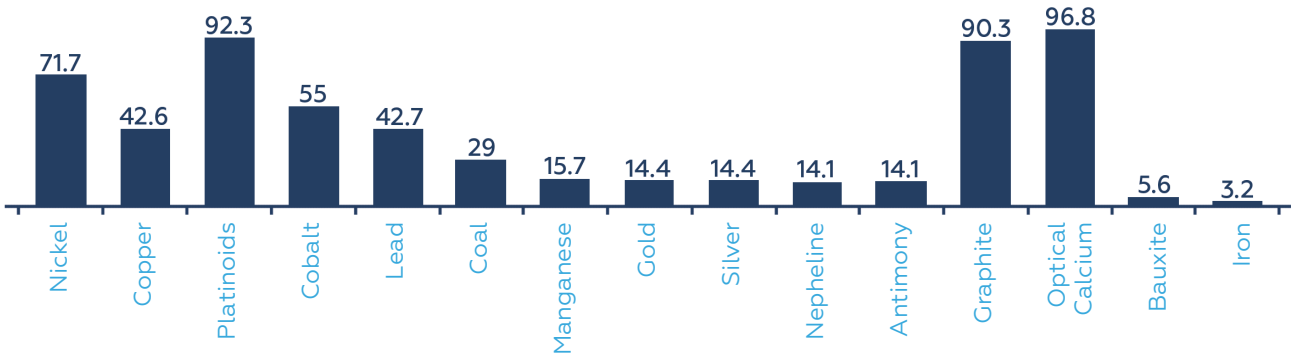


Universities providing skills and competencies close to new professions of the agro-industrial complex

EXTRACTING INDUSTRY

Changing the set of professional skills in the industry

Enterprises implementing their projects in the framework of Yenisey Siberia CIP mostly belong to the extractive industry. Nickel reserves in the Krasnoyarsk Territory account for 71.7% of the reserves of the Russian Federation, platinoids - 92.3%, graphite - 90.3%, coal - 26%. The explored deposits of the Republic of Khakassia contain: coal - 3% of the reserves of the Russian Federation, iron ores - 1%, molybdenum - 11%, barite - 27%, bentonite – 6.5%, facing stones – 13%. More than 50 deposits and ore occurrences of rare metals have been identified in the Tyva Republic. The industrial reserves of these deposits for tantalum, niobium, zirconium, hafnium, lithium, rare earths and uranium range from 10 to 35% of the all – Russian. About 30% of the balance reserves of zirconium dioxide of the Russian Federation are concentrated in the Ulug-Tanzesk rare metal deposit.



Russian reserves of natural resources on the territory of the Krasnoyarsk Territory, the Republics of Khakassia and Tyva, %

The Krasnoyarsk Territory ranks 1st in the Russian Federation in terms of deposits of coal, palladium, technical diamonds, nickel, magnesite, graphite, lead; 2nd place in terms of proven gold reserves; 3rd place in terms of identified reserves and the amount of forecasted resources of solid minerals.

The Republic of Khakassia is one of the oldest mining regions in eastern Russia. Iron, molybdenum, gold, coal, mineral and radon waters, non-metallic minerals are mined on its territory. Deposits of copper, polymetals, phosphorites, asbestos, gypsum, jade, and jadeite have been also explored.

In 2016, with a total production of 2,704 kg, the Republic of Khakassia ranked 16th among 27 gold-mining regions of Russia.

These indicators show the prospects for the development of the mining industry in the territory of the Yenisey Siberia, the need for new developments that meet the requirements of advanced enterprises of the future, and the manifestation of new professions that take into account the requirements of ecology, waste-free production, the introduction of a quality system and «digital mines».

Significant deposits of coking and thermal coal, cobalt, gold, non-ferrous rare metals, and rare earth elements have been identified on the territory of the Tyva Republic. Tyva occupies the 2nd place in the Russian Federation in terms of metal ore production index, in terms of production index «Coal mining» – 2nd place.

1
place
coal, palladium, technical diamonds, nickel, magnesite, graphite, lead reserves

2
place
- proven gold reserves
- total oil and natural gas reserves
- forest resources reserves

3
place
according to the identified reserves and the amount of forecast resources of solid

The place of the Krasnoyarsk Territory in the Russian Federation for mineral



About 26% of Russian coal reserves are concentrated in the Krasnoyarsk Territory. Up to 30% of the total coal production is accounted for by consumption in the energy sector of the Krasnoyarsk Territory by the enterprises of Yenisey TGC (TGC-13) JSC and companies that have separated into independent ones and are part of Siberian Generating Company LLC.

Thus, the current scale of coal mining does not correspond to the potential of mineral raw materials base, which allows to extract up to 100 million tons of coal in the future for at least 200 years.

Krasnoyarsk Territory is one of the most

«Forestered» regions of the Russian Federation, which accounts for 13.9% of the forested areas. (Russian Federation - 1,183,256.8 thousand hectares). The land area of the Krasnoyarsk Territory, on which forests are located, is 163,944.0 thousand hectares.

Despite the fact that the Krasnoyarsk Territory has the largest forest resources in the country, the percentage of development of the estimated cutting area is extremely low - only 16% with the permissible volume of withdrawal of forest resources 82 million m3. In the Irkutsk region, 37% is mastered at 71.5 million m3, in the Republic of Buryatia - 20% with an estimated cutting area of 11 million m3.

The Krasnoyarsk Territory generates about 6% of the total amount of electricity produced by the country. Large energy facilities are located on the territory of the region - Krasnoyarsk hydroelectric power station, Krasnoyarsk

GRES-2, Nazarovskaya GRES, Boguchanskaya HPP and Berezovskaya GRES-1.

In terms of electricity production per person, the Krasnoyarsk Territory ranks 2nd in Russia. Two of the largest hydroelectric power plants in Eurasia - Krasnoyarsk and Sayano-Shushenskaya - have been built on the Yenisey River. On the basis of the Kansk-Achinsk coal basin, the Kansk-Achinsk fuel and energy complex (KATEK) with the most powerful in the world Berezovsky GRES-1 and GRES-2. Current sections of the basin

(Borodinsky, Nazarevsky, Berezovsky) annually supply for about 55 million tons of coal for the needs of power engineers.

A significant part of the coal goes to the thermal power stations of neighboring regions - Novosibirsk, Irkutsk and other regions.

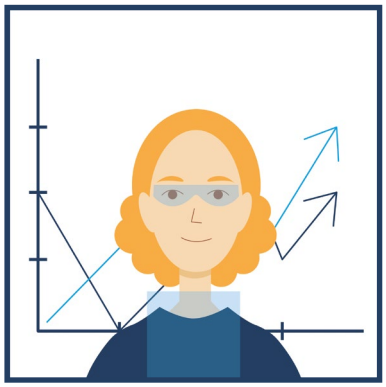
Underestimation of production, price volatility, increased spending, environmental challenges, suspension of projects, declining global demand and growing risks of occupational safety and health are the main problems faced by mining companies today.

Five main issues that need to be resolved in the near future:

- increase production efficiency through the collection and reasonable use of data;
- introduction of innovations related to the use of technologies and computer applications already widely used in other industries;
- expanded use of information technologies instead of technological optimization of old methods;
- introduction of new technologies in connection with the increasing requirements for environmental protection at the sites of extraction and processing of raw materials;
- implementation of methods for managing end-to-end processes and the use of engineering and application software methods, as well as platforms for collecting and displaying data from various sources.

Digitalization, automation and new technologies can provide operators and technicians with quick access to important information regarding productivity, work conditions and technical equipment. Having this kind of data speeds up decision-making and increases work efficiency. In addition, digitalization provides safer working conditions, promotes interaction between production sites and increases the attractiveness of work for the new generation of mining workers.

Such solutions in the field of artificial intelligence, automation and innovation as, for example, X-ray diffraction and electric vehicles are already used in the mining industry. In the near future, according to experts, digitalization in the mining sector will completely catch up with the technological revolution 4.0. It is obvious that digitalization of the mining industry is no longer a choice, but an urgent need.

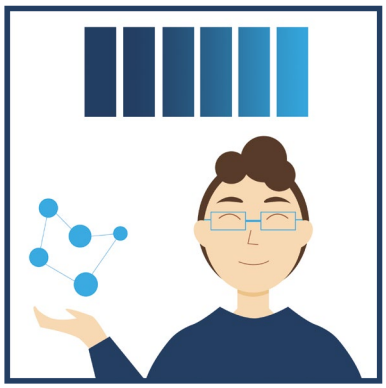


REMOTE SECURITY COORDINATOR

Operator of new automated and robotic security systems, who monitores their condition using sensors and surveillance cameras. Monitors both technical, natural and other changes at the facility. The main task is to prevent emergencies of any kind.

Professional skills and abilities

- cross-industry communication skills
- environmental conscious thinking
- ability to work under uncertainty and rapid change of task
- projects and processes management
- ability to find information solutions

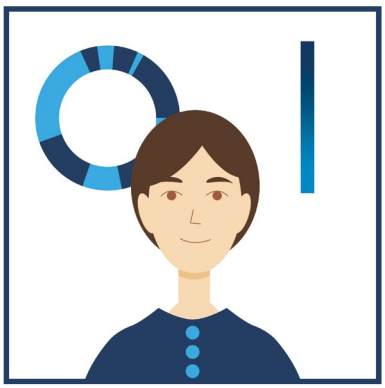


TELEMETRY DATA SYSTEMS ENGINEER

Specialist who analyzes data coming from the field for effective monitoring of the production process, prevention of possible emergencies and making operational decisions. He or she deals with with digital doubles and big data (including economic, climatic, seismic, etc.). The main task is to prevent poorly managed situations.

Professional skills and abilities

- project and process management
- ability to find information solutions
- ability to work under uncertainty and rapid change of task



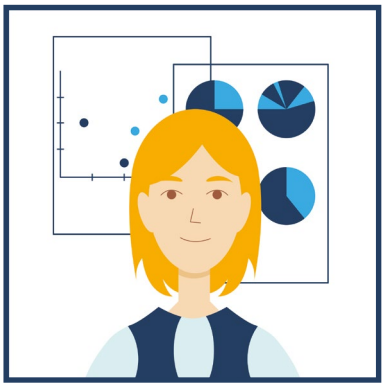
ROBOTIC SYSTEMS ENGINEER

Specialist who maintains and manages automated systems for monitoring, development, extraction and processing of mineral deposits (including remote ones).

Professional skills and abilities

- systems thinking
- intersectoral communication skill
- programming, robotics, artificial intelligence
- ability to find information solutions
- lean manufacturing skills
- cognitive flexibility

DISTRIBUTED TRANSACTION COORDINATOR

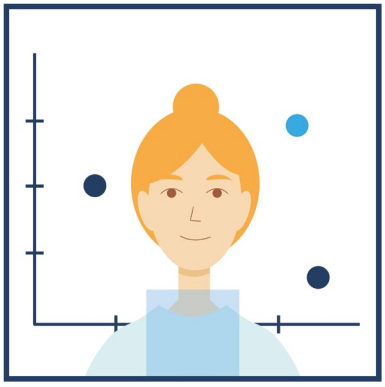


Specialist whose task is to ensure the coordinated interaction of people, some of whom are located directly at the facility, while some are involved in the project remotely. The main responsibility is to set tactical tasks and to ensure team's communication is conflict free.

Professional skills and abilities

- systems thinking
- project management
- lean manufacturing skills
- people management skills
- ability to negotiate
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task

UNMANNED EXPLORATION AIRCRAFT OPERATOR



Professional who controls the process of field development and exploration of new fields using unmanned aircraft equipped with magnetometers and other geophysical sensors.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- programming, robotics, artificial intelligence
- project and process management
- ability to find information solutions
- cognitive flexibility

PETROPHYSICIST



Professional in petrophysics (rock physics) working in the interdisciplinary field of geology (petrology, lithology, mineral sciences, hydrogeology, engineering geology, geocryology, etc.) and geophysics (deep, regional, exploration, engineering, environmental), as well as engaged in physical studies of the Earth and the physics of matter. Studies various physical properties of rocks, their interrelationships with each other and with the physical fields of the Earth. In a broader sense, their activities include the interpretation of data from geophysical well surveys (GIS) and seismic exploration.

Professional skills and abilities

- cross-industry communication skills
- environmental conscious thinking
- ability to work under uncertainty and rapid change of task
- ability to work with people

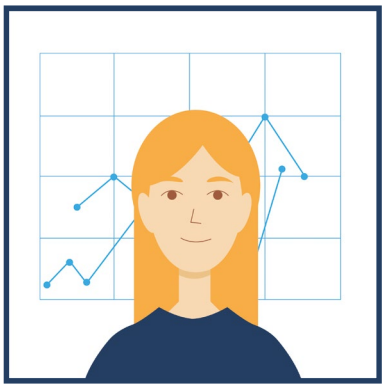


MINING SYSTEM ENGINEER

A specialist who is engaged in the work with objects of nature resource use of a full life cycle (from prospecting and exploration to the closure and reclamation of deposits), taking into account the complexity of these objects. For example, oil and gas fields may be located on the same territory, and it is necessary to harmoniously combine fundamentally different technologies for the extraction of these minerals.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- programming, robotics, artificial intelligence
- project management
- lean manufacturing skills
- environmental conscious thinking

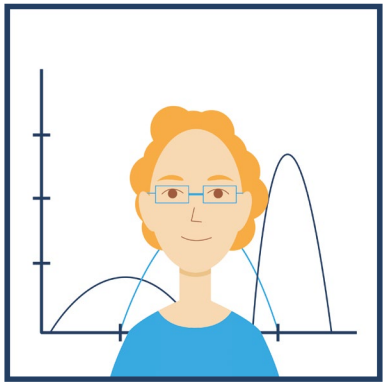


ROBOTS MAINTENANCE TECHNICIAN

Specialist who maintains and manages automated systems for monitoring, development, extraction and processing of mineral deposits (including remote ones). In Russia, this job is already in demand.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- programming, robotics, artificial intelligence
- lean manufacturing skills
- ability to find information solutions



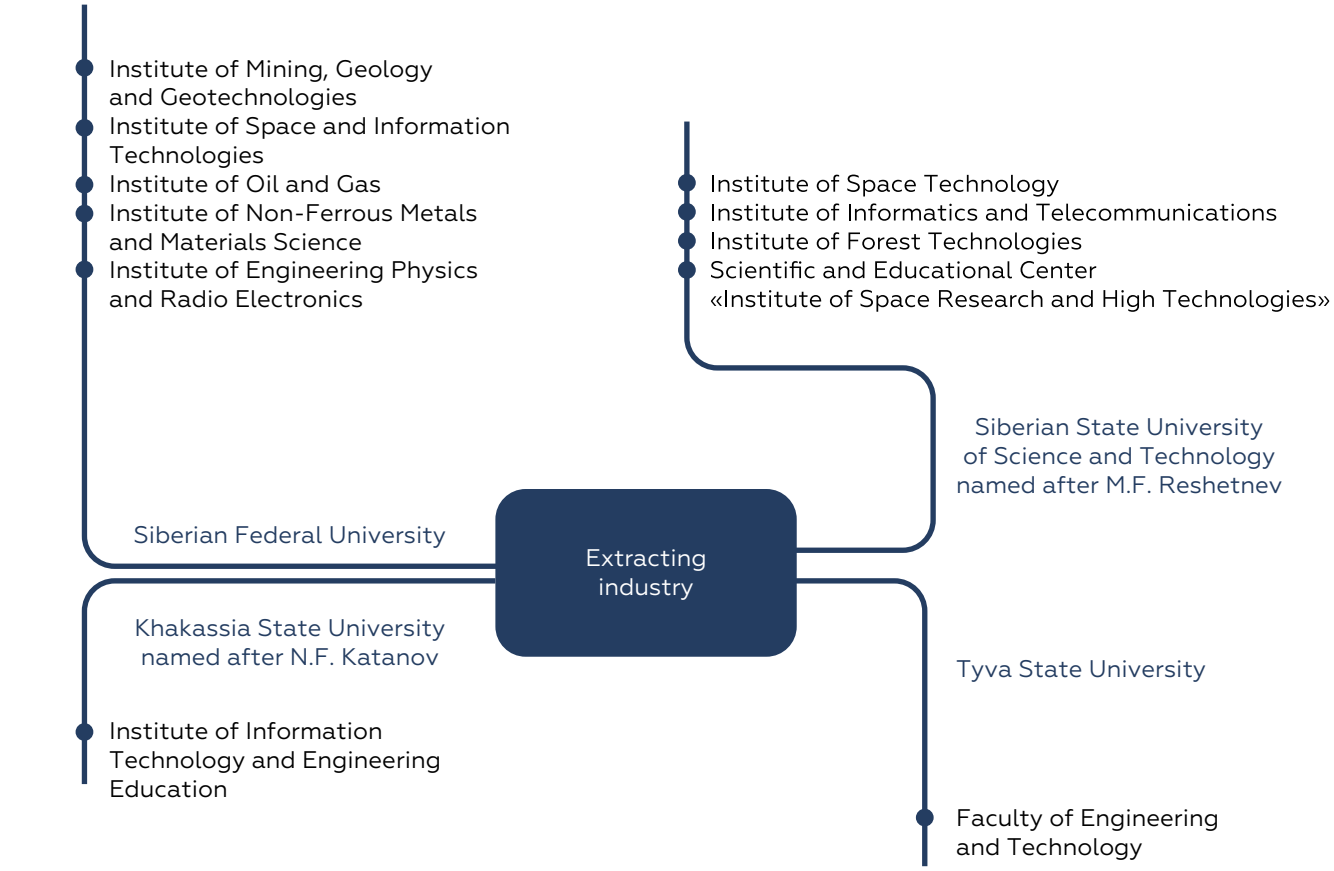
ROBOTIC SYSTEMS ENGINEER

Specialist who controls the process of developing a future deposit while causing minimal damage to the environment (including transport and logistics interchanges, energy supply, accommodation of personnel). Also controls the process of field operation that ensures maximum environmental friendliness of the used sites (or reuse options). The scope of their activities includes issues of greening waste, emissions, empty rock, slags, etc.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- project management
- environmental conscious thinking
- stress tolerance, ability to work in a team
- lean manufacturing skills

Where can i receive basic training in the specialty in the Yenisey Siberia regions?



Universities providing skills and competencies close to new professions of extracting industry

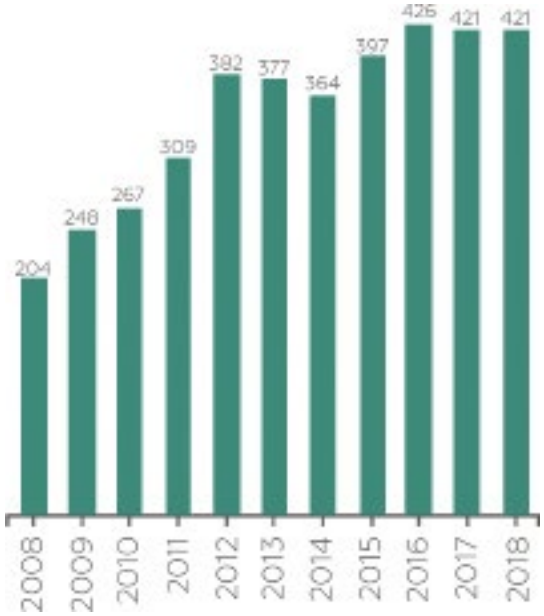


PROCESSING INDUSTRY

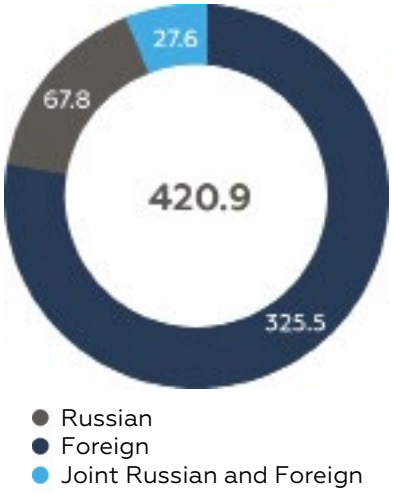
Changing the set of professional skills in the industry

The total volume of capital investments contributed to economy and social sphere development of the Yenisey Siberia regions amounted to 1382.4 billion rubles from 2016 to 2018. Krasnoyarsk Territory is one of the leaders in terms of investment activity in Siberia and Russia. Over the period from 2008 to 2018, investments in the economy of the region increased by more than 2 times. The volume of investments of the Krasnoyarsk Territory makes up about 27% of the total investment volume of the Siberian Federal District. By the volume of investments in fixed assets, including per capita, the Krasnoyarsk Territory was on the 16th place, the Republic of Khakassia - on the 64th place, the Tyva Republic - on the 83rd place among the regions of the Russian Federation in 2018. In the Krasnoyarsk Territory there was an increase in the share of investments aimed at the acquisition and modernization of machinery and equipment in the specific structure of capital investments. In the Republic of Khakassia it was aimed at the purchase of vehicles and in the Tyva Republic at the construction and reconstruction of facillities and residential buildings.

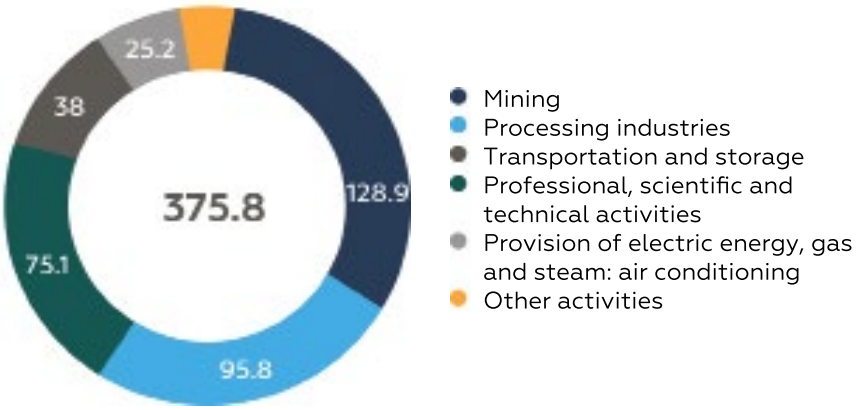
These processes indicate favorable opportunities for the development of the processing industry in the Krasnoyarsk Territory, the Republics of Khakassia and Tyva and the prospects for new jobs emerging.



Dynamics of the volume of investments in fixed assets, billion rubles



Structure of investments in fixed assets by type of ownership, 2018, billion rubles



Investments in fixed assets by types of economic activity, 2018, billion rubles

Among the trends and problems of **personnel training and new professions** for the processing industry of the Krasnoyarsk Territory, the Republics of Khakassia and Tyva, the following can be distinguished:

• lack working professions: it is very difficult to find a good electrician, plumber, machine operator, cabinetmaker, turner and milling cutter or assembler with good knowledge of mechanics;

• all maintenance personnel add-ons will be cut, processes will be more automated incresing efficiency, which means that those who do not generate revenue will be made redundant;

• employees who can contribute to digitalization, automation, robotics and other innovative areas will be most in demand;

• increased interest is also observed in the field of cloud solutions and service models. So the demand for specialists with knowledge of cloud platforms, understanding and compliance with SLA will grow.

Professionals understanding technological processes of the processing industry will be highly sought after as well:

• high-class universal data scientists;

• analytical data experts with technical skills. These are people who are able to solve new tasks for predicting business events, reducing the level of uncertainty and risks;

• «craftsmen» in data science. There is a prowing number of ready-made algorithms, models, and libraries. It means that not only scientists-inventors, but also applied specialists of a narrower profile will be in demand. It includes data analysts, quality control and data cleaning specialists, data engineers for building storage facilities and infrastructure;

• data project managers are no longer only top managers and leaders of digital transformation, such as chief data officer, but also middle-managers. Their role is to lead projects introducing new algorithms for business processes such as machine learning models. These include effective project and product managers with strong communication skills. Such professionals should understand the pains of business and set tasks for data scientists and analysts and be able to manage the process of implementing new algorithms;

•business process optimization professionals: Operation Director, Executive Director, auditor;

•marketing managers, including PR, advertising, promotion and presentation of services or goods;

• communication specialists of various fields.

Engineers, architects, presales - specialists who clarify the details of the project implementation will always be needed (these professionals also have technical knowledge, so they are aware of all the nuances of a complex technical product, without actual participation in the production process. They are a link between a client and a technical department implementing the project). Analysts, project managers, line managers, specialists who can design and use 3D casting, or use a rotary 3D printer for making turbines and engines are also becoming more and more vital.





ISU (CHIEF PROJECT ENGINEER), INTEGRATED MANAGER

Chief Project Engineer of industrial design. Combines the functions of a project manager of commercial processing facilities: conducts reporting, is engaged in the formation of a project team, selection of subcontractors, drafting contracts and forming project costs for subcontracting work, forming schedules, designing and issuing orders, preparing commercial proposals to potential customers.

Professional skills and abilities

- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- IT competencies



PRODUCT DESIGNER

A specialist responsible fornew products, market analysis, assortment policy, pricing, product promotion, KPI planning, product requirements formation. A professional of this kind must understand the needs through trends, be proficient in sociology and technology.

Professional skills and abilities

- client focus
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- project and process management
- ability to find information solutions

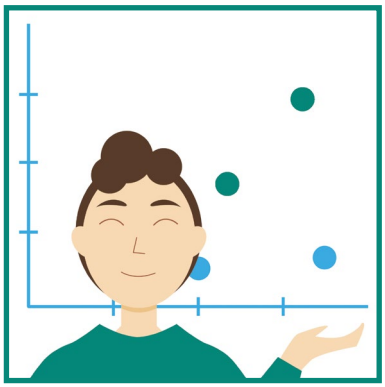


INNOVATION DEVELOPMENT MANAGER

Professional who introduces a new idea into production in order to create a competitive profitable product. Functions: preliminary calculation of the volume of needs for an innovative product; search (or creation) and analysis of innovative ideas according to the needs of the population; development of a project plan, marketing policy and business idea; search for a suitable enterprise capable of implementing this innovation; joint work with a specific enterprise to develop technology and production techniques; search for suppliers of necessary equipment and raw materials, conclusion of contracts. Justifies and minimizes risks of the project.

Professional skills and abilities

- client focus
- cross-industry communication skills

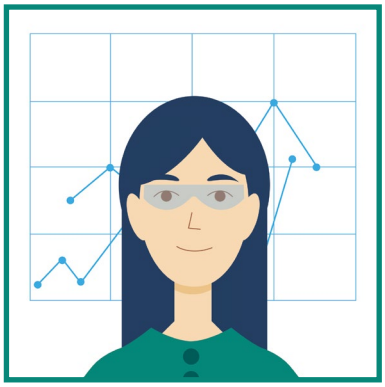


COMMUNICATIONS TECHNOLOGIES MANAGER

Specialist engaged in the formation of means of regulatory and legal interaction in the Net. Develops legal protection systems for people and property on the Internet (including virtual property). Organizes online and offline dialogues between public activists and officials responsible for specific areas related to the processing industry and its infrastructure to develop joint solutions. The main trend is the integration of the local population into production.

Professional skills and abilities

- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- project and process management
- ability to projects and processes



DIGITAL PLATFORMS MANAGER

Professional who organizes the work of digital platforms. Conducts a preliminary assessment of projects to attract funding, examines conflicts between project parties.

Professional skills and abilities

- client focus
- ability to negotiate
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- project and process management
- ability to find information solutions
- systems thinking



BUSINESS MODEL SPECIALIST

Profissional with knowledge of technology and market. Creates a company's business model, logically and schematicallu explaining the business structure. Identifies options for reference points and indicators that will be successfully used for the purpose. He pr she can quickly change the business model depending on changes in strategies or market situation. Such a specialist is able to generate new models.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- ability to work with projects
- IT competencies



CONTRACT MANUFACTURING TECHNICIAN

Professional responsible for the product relese at the facilities of an independent manufacturer, ensuring full compliance with the technological cycle and quality control of finished products in accordance with customer requirements.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- client focus
- ability to negotiate



CYBERSECURITY TECHNICIAN

Professional who must have knowledge of technologies, business processes, IT, economic processes, programs. Identifies threats to information security and risks of data loss, develops and implements measures to counter threats and solutions to protect against information loss; ensures the consistency and confidentiality of data; participates in the development and implementation of IT solutions.

Professional skills and abilities

- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- projects and processes management
- ability to find information solutions



ECOLOGY TECHNICIAN

Specialist who deals with technology, economic and environmental components. Engaged in the local study of the state of the environment and the development of measures to minimize the negative consequences of human economic activity, including the introduction of compensatory obligations to prevent degradation processes in the ecosystem.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty
- IT competencies
- environmental conscious thinking



BIM MANAGER

Professinal in the field of BIM-technology (BIM - Building information Modeling - information modeling of buildings and facilities is a modern method of designing buildings and facilities of processing industry). Designers create a model of the future facility and fill it with data.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- ability to work with projects
- IT competencies

Where can i receive basic training in the specialty in the Yenisey Siberia regions?

Processing industry

Siberian State University of Science and Technology named after M.F. Reshetnev

- Institute of Chemical Technologies
- Institute of Forest Technologies
- Institute of Mechanical Engineering and Mechatronics
- Institute of Informatics and Telecommunications
- Institute of Space Technology
- Engineering and Economic Institute

Siberian Federal University

- Institute of Space and Information Technologies
- Institute of Non-Ferrous Metals and Materials Science
- Scientific and educational complex in the field of economics and management
- Polytechnic Institute

Khakassia State University named after N.F. Katanov

- Institute of Information Technology and Engineering Education

Universities providing skills and competencies close to new professions of processing industry

HIGH-TECH INDUSTRY

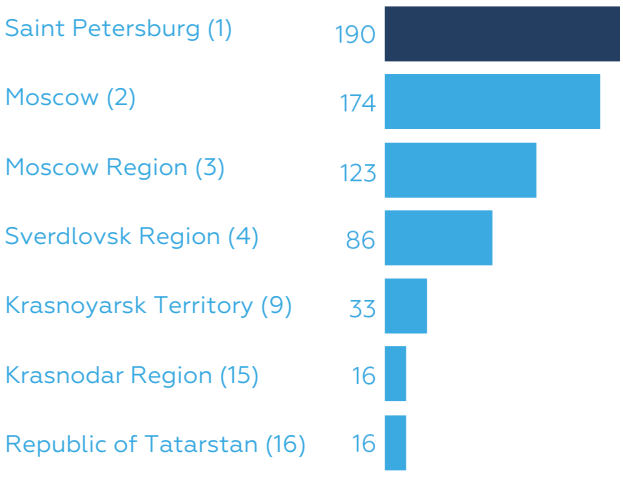
Changing the set of professional skills in the industry

The competitiveness of a region is determined by the presence of advanced competitive industries or industry segments. Krasnoyarsk Territory receives 70% of taxes from industry. It is high-tech production, infrastructure and the production of products with high added value that will allow the region to respond to the challenges of the world.

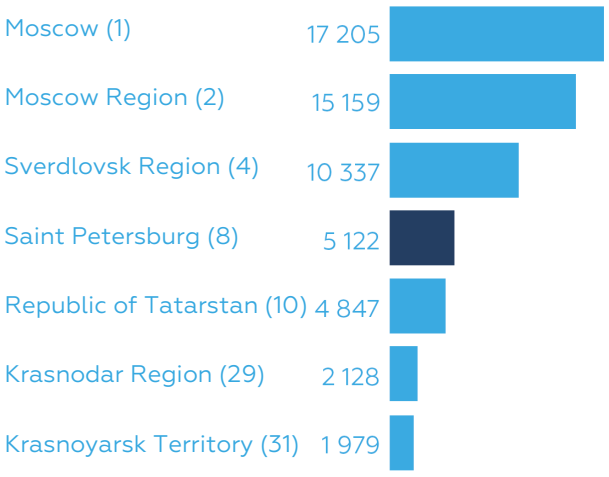
An important role in the development of these industries is played by the introduction of innovations, including advanced information technologies. Sufficiently high costs of information technology in the Krasnoyarsk Territory (9th place in Russia), a number of advanced production technologies created (9th place), a small number of advanced production technologies used (31st place). These figures allow us to talk about the low level of development of the Krasnoyarsk Territory IT industry.

High innovation activity and efficiency also have a significant impact on the level of competitiveness of the region. In terms of personnel engaged in scientific work and patents issued, the Krasnoyarsk Territory is in the top twenty among the regions of Russia (17th and 14th places, respectively). However, in terms of the volume of innovative goods, works and services and their share of the total number of goods, works and services, the Krasnoyarsk Territory is on the 33rd and 64th places among the regions of Russia, respectively. Thus, the target priority is to further increase innovation activity, implement a set of measures to introduce innovative developments into production processes that require new jobs.

The number of advanced production technologies created, units.



The number of advanced production technologies used, units.



Information and technologies: indicators of of advanced technologies use; characterization of the Krasnoyarsk Territory rating (2017)

It is necessary to highlight the main directions of the high-tech industry that are relevant for the Yenisey Siberia regions.

The newest industrial branches are classified as high-tech, depending on how deeply a person takes part in the technological process. The smaller the participation is, the higher the technology is considered.

High technologies (high tech, hi-tech) are very complex technologies, often including electronics and robotics, used in production and other processes.

High-tech industries include:

1. Social directions:

- news distribution systems;
- technologies of collective work:
- learning technologies.

2. Electronics.

3. Software:

- Artificial intelligence;
- wireless technology;
- robotics;
- nanotechnology;
- environmentally friendly technologies.

4. Energy saving and alternative energy:

- waste recycling;
- nuclear power;
- solar energy:
- hydrogen energy.

5. Security systems:

- biometrics;
- sensors, detectors, electronic analyzers;
- covert surveillance systems.

6. Navigation technologies.

7. Defense technologies and dual-use technologies:

- rocket science;
- creation of spacecraft.

8. Biotechnologies:

- genetic engineering and gene therapy;
- microbiological industry.

9. Organic chemistry.

10. Pharmacology.

11. Creation of new materials.

12. Transport.

All of these industries are represented in the Krasnoyarsk Territory, the Republics of Khakassia, Tyva. Each industry requires new professionals.

First of all, IT specialists of all directions and levels will be needed: from programmers to CIOs.

Secondly, specialists in digital products and solutions. digital marketing managers and online training specialists will be in demand. Thirdly, the search for analysts, big data experts and various analytical tools is gaining momentum.

The demand for professions is already growing:

- developers (JS, Golang, Kotlin, Swift, Java, C++, PHP);
- developers of Objective-C, Android, Python;
- UI and UX experts:
- digital designers of internal architecture and mobile applications interfaces;
- DevOps operation engineers (DevOps methodology is a set of practices that reduce software development time and speed up the release of its updates), NetOps
- machine learning specialists, data mining (C++, Python);
- project – and product-managers: an increasing number of «features» (unusual characteristics of a product, additions to the software) and products make companies to hire even more people responsible for the implementation of the product;
- IT managers with experience and management skills in product development: specialists involved in improving the professional level of subordinates, who are able to choose a certain type of data (stack) for a task and are business-oriented, will be in even greater demand.

For the high-tech industry of the Yenisey Siberia regions, the emerging **jobs** will be:

- data analysts;
- product owners;
- specialists assisting to new reality adaptation;
- marketing managers for launching new products;
- mobile application architects;
- transformation directors;
- Directors of Strategy;
- experts in the field of intellectual property and patenting at the level of the intellectual property direction/group leaders.



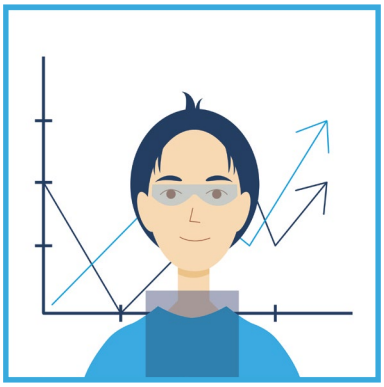


FORESIGHT ANALYST

Professional in this field calculates the risks for the future. Accurate and reliable forecasts relate to the development of artificial intelligence and the assumed planetary ecological security. Engaged in forecasting the future, including extrapolating existing technological, economic or social trends.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- client focus
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- systems thinking

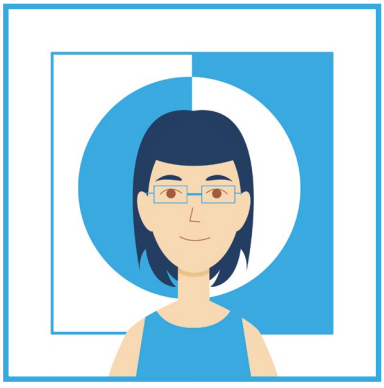


EDUCATIONAL TRAJECTORIES CREATOR

Professional in this field is able to develop an education strategy, or a development trajectory for various specialists, conducts educational activities through remote systems and cycles - school, university, enterprise. Based on the reviews, summarizes the key theoretical and practical provisions for innovations: their creation, management, and features in various fields; identifies relevant innovations in the implementation of educational programs.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with projects

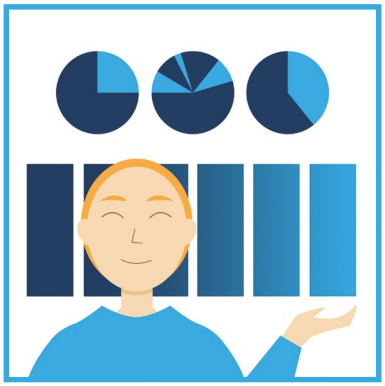


VIRTUAL WORLDS DESIGNER

Specialist in this field creates virtual worlds of their own nature, architecture and laws. Develops systems and structures, initializes, controls, determines capabilities, and also optimizes the project, contributes to cost reduction, creates a process for determining the architecture, components, interfaces and other characteristics of the system or its parts.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- ability to work with projects
- IT competencies

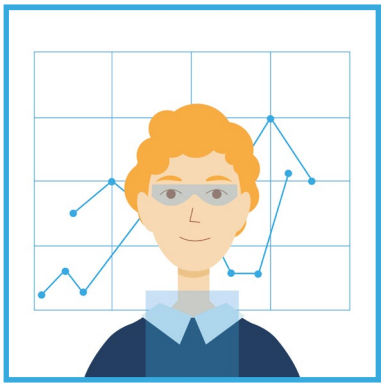


EDUCATIONAL AND INNOVATIVE MICROSTRUCTURE MANAGER

Professional who knows how to manage projects, communication, and knows the methods of systemic strategic thinking. Strives towards consistency of the competencies description in educational and practical fields of project management, and also applies methods of developing and managing the educational process based on improving the quality of university graduates training. Defines means of innovation in the education system.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- client focus
- ability to negotiate
- cross-industry communication skills



SYSTEM DESIGNER

Specialist who develops systems and structures; initiates, controls, determines their capabilities. Optimizes the project, helps to reduce costs, creates a process for determining the architecture, components, interfaces and other characteristics of the system or its part. The result of the design is a project as an integral set of models.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- ability to work with projects
- IT competencies



FORECASE TECHNOLOGYST

Specialist in this field has engineering foresight, can analyze innovations, understands the technological features of production. He or she is able to compile technologies from various systems and adapt technologies to the needs of the project, as well as ensure that products comply with quality and safety standards and develop technologies for manufacturing innovative products.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- client focus
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- cognitive flexibility

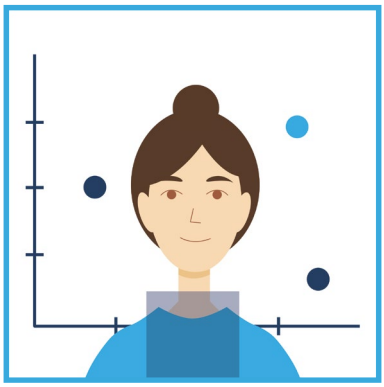


UNIVERSAL INDUSTRIAL MACHINES OPERATOR

Professional who must understand the operation of industrial machines; conduct operational analysis of incoming digital data; can design and ensure machine relationships; applies robotic systems interchangeability and possess operational reprogramming skills.

Professional skills and abilities

- decision making and judgments forming skills
- ability to work under uncertainty and rapid change of task
- systems thinking
- stress tolerance, ability to work in a team
- cognitive flexibility



EDUCATIONAL TRAJECTORIES ARCHITECT

Professional in this field is engaged in «assigning» values, developing a strategy for systems and their coordination, creating neural networks. Can work as a consulting and training manager to help an employee to achieve a certain life or professional goal. Creates remote support and development programs. Motivates people to work in the latest innovative fields.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- ability to work with people
- ability to work with projects
- IT competencies



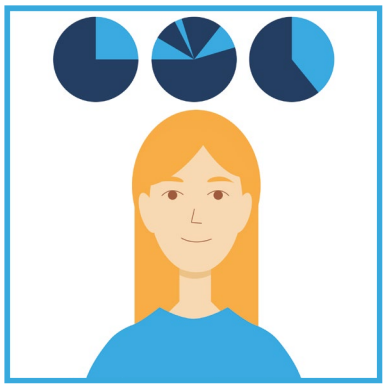
FREELANCE, OUTSOURCING MANAGER

Professional who takes over communication with freelancers and acts as an intermediary between the client and the freelance manager. These professionals often act as project managers who assemble a team of freelancers and communicate with them on behalf of the client. They draw up technical specifications, distribute the work among team members, check and provide the customer with the finished result.

Professional skills and abilities

- ability to learn new things quickly
- the ability to formulate a very complex task in very simple language
- ability to quickly switch from one task to another
- client focus
- ability to analyze large information blocks

FUNCTIONAL TECHNOLOGY SCOUT

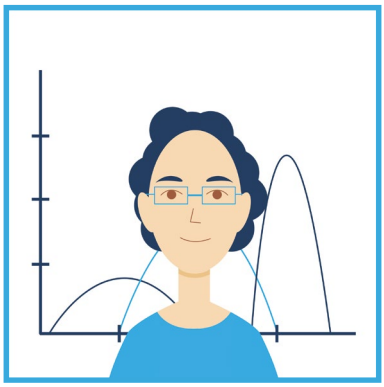


This specialist is an expert in the field of knowledge. The purpose of scouting (Search) is to achieve a competitive advantage by obtaining data on potential opportunities or threats arising from the emergence of new technologies at the early stages of their development. Main functions: technological intelligence, technological forecasting, technological research, strategic forecasting, technological monitoring, scanning (tracking) of technologies.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- ability to negotiate
- cross-industry communication

BIG DATA-ANALYST



Developer of data collection models. Analyzes information, visualizes and interprets it. His or her goal is to collect raw unstructured data and transform it into a new understanding of the problem posed regarding clieits and processes. Identifies patterns in this data in order to use them for future production. Such a specialist is able to remove unneccessary parts from the raw data and implement tools that will characterize trends and predict their behavior. Helps to predict changes and justify decision-making.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- client focus
- ability to negotiate
- cross-industry communication skills

IT AUDITOR



Specialist who makes a security decision based on data.
Engaged in software development, security and cybersecurity audit. Performs verification of technologies and products for their compliance with standards and norms, analyzes the consequences of IT developments for the health of the user.

Professional skills and abilities

- systems thinking
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- IT competencies



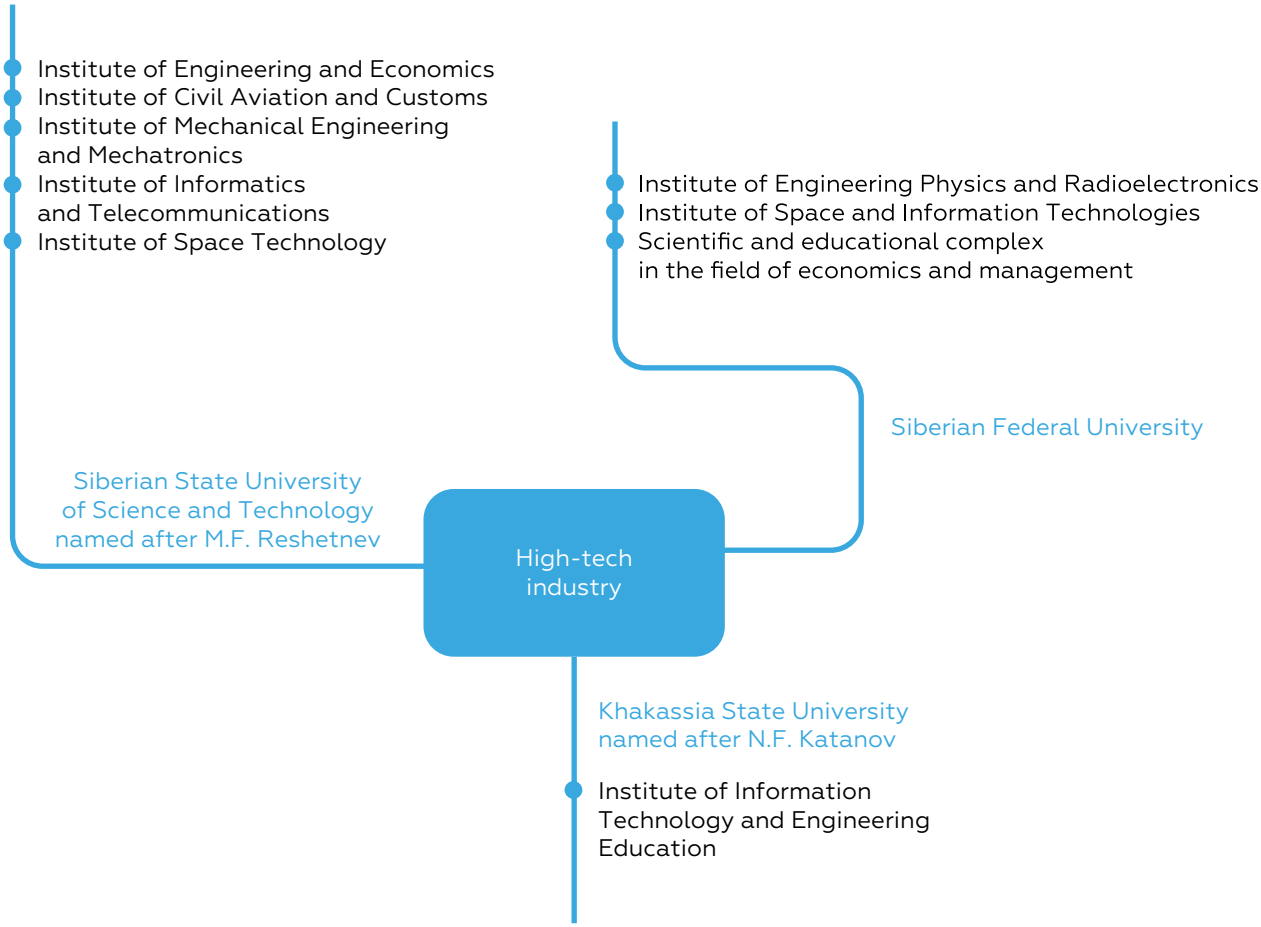
IT MOTIVATION MANAGER

Specialist who identifies the needs of employees related to a certain type of professional activity. Combines needs, competencies and projects, encourages staff to non-standard creative solutions in the field of new projects. Prevents professional burnout.

Professional skills and abilities

- IT competencies
- decision making and judgments forming skills
- client focus
- ability to negotiate
- cross-industry communication skills
- ability to work under uncertainty and rapid change of task
- project and process management

Where can i receive basic training in the specialty in the Yenisey Siberia regions?



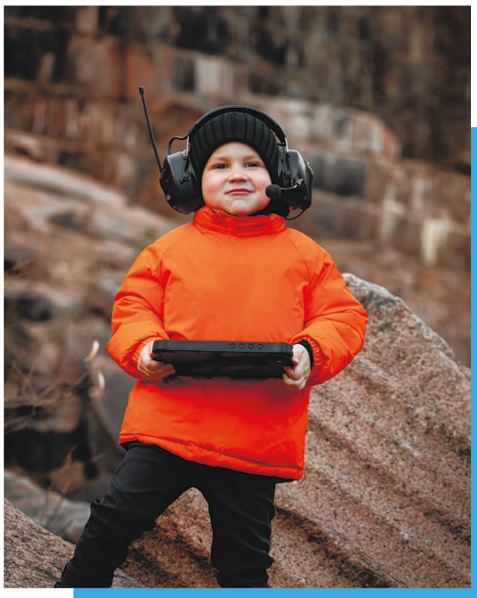
Universities providing skills and competencies close to new professions of processing industry



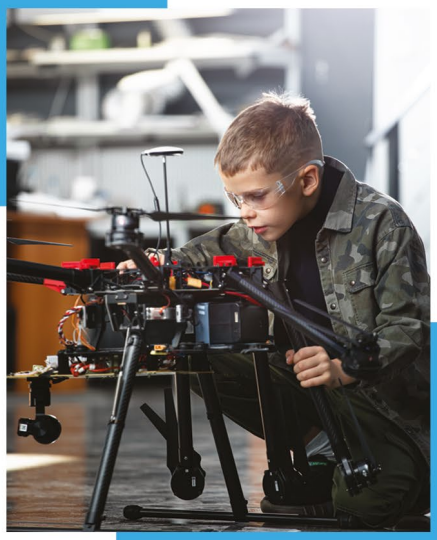
FUTURE JOBS

#WHOTOBECOME

The heroes of the photo project are the children of the Siberian Federal University employees, who will become the first certified specialists of the future n 10-15 years time.



Mining System Engineer
Nikolay, 4.5 years old



Unmanned exploration aircraft operator
Alexander, 7 years old



Ecology technician
Miroslava, 6 years old

Robotic systems engineer
Ruslan, 8 years





BIM-Manager
Agata, 4 years old



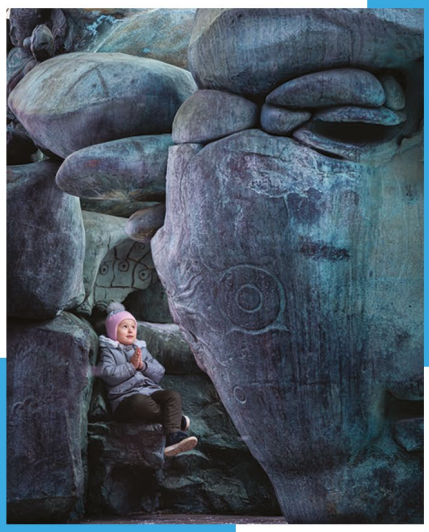
Gastronomic brands designer
Anna, 8 years old



Breeder of endangered
Animal species
Agata, 5 years old

Terraformer
Yaroslav, 11 years old





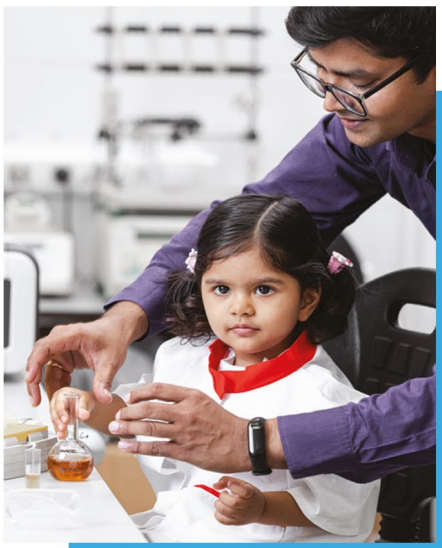
IT Motivation Manager
Mira, 3.5 years old



Maintenance technician
for robots, machines
Ilya, 6 years old



Virtual worlds designer
Darya, 10 years old
Milana, 8 years old



Bioproduction technician
Priamvada Rajan, 2 years old



System Designer
Ekaterina, 4 years old

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